Sole Source Justification

Specifications for SpectraMax M5 Multimode Microplate Reader

Part number: M5

Available read modes	**SpectraMax M5** Multimode Reader has a 3-mode cuvette port (Absorbance (ABS), Fluorescence Intensity(FI), Luminescence (Lum)) and 6- to 384-well microplate capabilities for all 5 modes (ABS, FI, Lum, Time-Resolved Fluorescence (TRF)and Fluorescence Polarization (FP)).
Upgradeability	**SpectraMax M5** Reader is upgradeable to M5e HTRF Certified Status via factory upgrade process.
LanthaScreen Certification	**SpectraMax M5** Reader is certified for Life Technologies' LanthaScreen assay.
Acceptable microplate types, cuvette types, test tube types	**SpectraMax M5** Reader is capable of reading absorbance, fluorescence, and luminescence in standard, commercially-available cuvettes and microcuvettes, 12 x 75 mm test tubes, and 96- or 384-microplates. The reader contains a built-in cuvette port and a microplate drawer and all reads can be performed with a single wavelength selection operation.
Xenon lamp longevity	**SpectraMax M5** Reader uses a Xenon flash lamp for longer lamp lifetime.
Single light source reproducibility	**SpectraMax M5** Reader uses a single Xenon flash lamp for greater consistency and reliability.
Monochromator-based wavelength selection for Fluorescence Polarization	**SpectraMax M5** Reader uses Dual Monochromators for tunable FP wavelength selection between 400 nm and 750 nm for excitation and emission wavelengths.
Monochromator based wavelength selection for Fluorescence Intensity and Time-Resolved Fluorescence	**SpectraMax M5** Reader uses Dual Monochromators for tunable FI, TRF wavelength selection between 250 nm and 850 nm for excitation and emission wavelengths, and tunable luminescence between 250 nm and 850 nm. No external filters are required for purchase in the future when additional assays are added to laboratory.
Monochromator-based wavelength selection of Absorbance	**SpectraMax M5** Reader uses Monochromator-based tunable absorbance wavelength selection between 200 nm and 1000 nm. No external filters are required for purchase in the future when additional assays are added to laboratory.
Top and bottom read optics	**SpectraMax M5** Reader has both top and bottom reading optics for improved sensitivity in cell-based assays.
Absorbance bandpass	**SpectraMax M5** Reader has a 4-nm absorbance bandwidth for superior peak resolution and increased accuracy of measurements for narrow bandwidth samples.

Fluorescence bandpass	**SpectraMax M5** Reader has a fixed fluorescence spectral bandwidth of 9 nm excitation and 15 nm emission for improved resolution between excitation and emission components. Narrow bandwidth is critical when designing multi-fluorophore assays or when using narrow Stokes shift fluorophores.
Number of wavelength pairs read	**SpectraMax M5** Reader can read up to four excitation and emission wavelength pairs in a single operation for multi-fluorophore assay designs.
Spectral scanning	**SpectraMax M5** Reader has full wavelength scanning capability across the entire spectral range for defining actual excitation and emission maxima. It can perform spectral scans in user-defined increments as small as 1 nm, and then it can select assay wavelengths for actual maxima. Increases sensitivity for assay by working at actual conditions rather than using literature references.
Patented AutoPMT capabilities	**SpectraMax M5** Reader has a patented (U.S. Patent No. 6,232,608) Automatic Photomultiplier Tube (PMT) setting that adjusts the optimum voltage for each well's sample concentration and then normalizes the raw data to show Relative Fluorescence Units (RFU) values. Wells are then selectively re-read at the optimal PMT setting. Photo-bleaching is eliminated because wells are not read unnecessarily.
Dual PMTs for Fluorescence and Luminescence	**SpectraMax M5** Reader has dual PMTs: an enhanced, low background PMT for high sensitivity luminescence measurements including luciferase-based reporter gene assays, and a separate digital/analog PMT for fluorescence reads.
Patented Path Check pathlength correction for Absorbance	**SpectraMax M5** Reader incorporates the patented PathCheck Sensor (U.S. Patents 5,959,738, 6,188,476, 6,320,662, 6,339,472, 6,404,501, 6,496,260 and 6,995,844). This is the only sensor of its kind not affected by temperature, and requires no accessories to measure the pathlength of the sample in all individual microplate wells. The pathlength measurement can be used to calculate concentrations without a standard curve, test liquid handling devices, detect and correct for pipetting errors, and expand the dynamic range of the assay.
Slow carriage speed option	**SpectraMax M5** Reader has the option to run the reader with a slow carriage speed to increase assay precision.

Read times	**SpectraMax M5** Reader has the following read times (minutes:seconds): 96-well 384-well Absorbance 0:18 0:49 Fluorescence Intensity 0:17 0:48 Fluorescence Polarization 0:42 2:03 Time-Resolved Fluorescence 0:17 0:48 Luminescence 2:00 7:00
Thermal regulation	**SpectraMax M5** Reader has thermal regulation for temperature dependent kinetic assays. Temperature is regulated up to 60°C. Three heat sources provide uniform temperature regulation across the plate (+/- 0.5°C well-to well @ 37°C). One heat source above the plate creates a small temperature differential, eliminating plate lid fogging during kinetic runs.
µMax Low Volume Microplate compatible	**SpectraMax M5** Reader is compatible with the µMax Low Volume Microplate. Enabling as low as 2µL sample detection at as high at 64-samples per plate, suitable for automation.
Compliance tools	**SpectraMax M5** Reader offers compliance support tools including: • Software validation package • IQ/OQ documentation • Physical validation test plates for absorbance, fluorescence, and luminescence
Absorbance validation plate	**SpectraMax M5** Reader offers automatic validation of absorbance performance with the SpectraTest™ ABS1 validation plate. The SpectraTest ABS1 validation plate provides NIST traceability, and performs 8 tests to easily verify optical performance for GXP compliance.
Fluorescence validation plate	**SpectraMax M5** Reader offers automatic validation of fluorescence performance with the SpectraTest™ FL1 validation plate. The SpectraTest FL1 validation plate performs 12 tests to easily verify optical performance for GXP compliance.
Luminescence validation plate	**SpectraMax M5** Reader offers automatic validation of luminescence performance with the SpectraTest™ LM1 validation plate. The SpectraTest LM1 validation plate performs 13 tests to easily verify optical performance for GXP compliance.
Automation-compatible design	The Microplate drawer on **SpectraMax M5** Reader is accessible to automation platforms so that no further physical instrument modification is required for all configurations.

StakMax Plate Handling System compatible	**SpectraMax M5** Reader can be integrated with the StakMax Plate Handling System.
Microsoft Windows 7, Vista, and XP compatible	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 is compatible with Windows 7, XP and Windows Vista.
Mac OS 10.5 compatible	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax pro v6 is compatible with Mac OS 10.5.
Cross-platform data files	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 offers a common file format allowing for data to be edited, saved, and shared by users on Windows and Mac operating systems.
Ready-to-run method protocols included	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 provides pre-packaged method protocols for common assays and applications.
Custom method design	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 allows users to design custom assay protocols; create meaningful reports, graphs, and multi-plate summaries. Protocols can be saved as menu-available through the Protocols drop-down menu., so that clicking the "Read" button will allow completion of the data report in the final format.
Data exporting capability	**SpectraMax M5** Reader is supported by SoftMax Pro software which offers direct export to Excel with multiple output formats, plate data and section selection options. Users can export as little or as much as they require making the data sharing a breeze.
Autosaving of data	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 allows autosaving of multiple copies of assay data to desired locations in one of three file formats, listed above.
Support for regulatory compliance	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 GxP supports US FDA 21 CFR Part 11 implementation through controls including required user logon, management of guest access, support for electronic signatures, data file audit trails, network and local autosaves, and a granular permission structure that includes operation of the reader within that permission structure.
Data analysis	**SpectraMax M5** Reader is controlled through SoftMax Pro. SoftMax Pro v6 allows for simultaneous evaluation of multiple standard curves, multiple plots in a single or multiple graphs, 4 and 5-parameter logistic curve fitting, BOOLEAN operators (e.g. If, And, Or, Not, False, True).

Applicable Patents for SpectraMax M5 Multimode Microplate Reader

PathCheck Pathlength Sensor	**SpectraMax M5** Reader utilizes U.S. Patent Nos. 5,959,738, 6,188,476, 6,320,662, 6,339,472, 6,404,501, 6,496,260, and 6,995,844 for temperature-independent absorbance pathlength correction with the PathCheck Sensor. Molecular Devices is the sole source for microplate readers with the PathCheck Sensor as described in the aforementioned U.S. patents.
Optical Path Switching Mechanism	**SpectraMax M5** Reader utilizes U.S. Patent No. 6,097,025 for a light detection device having an optical-path switching mechanism. Molecular Devices is the sole source for microplate readers that switch between top- and bottom-read optical paths as described in US Pat. No. 6,097,025.
AutoPMT Functionality	**SpectraMax M5** Reader utilizes U.S. Patent No. 6,232,608 for AutoPMT functionality in a scanning fluorometer. Molecular Devices is the sole source for microplate readers incorporating AutoPMT functionality as described in US Pat. No. 6,232,608.
Dual Monochromator Fluorescence Detection	**SpectraMax M5** Reader utilizes U.S. Patent Nos. 6,236,456 and 6,313,471 for dual monochromator optical system for a scanning fluorometer. Molecular Devices is the sole source for microplate readers incorporating the dual-monochromator architecture as described in US Pat. Nos. 6,236,456 and 6,313,471.
Unique Optical System	**SpectraMax M5** Reader utilizes U.S. Patent No. 6,316,774 for its unique optical system design for a scanning fluorometer. Molecular Devices is the sole source for microplate readers incorporating the optical design as described in US Pat. No. 6,316,774.
Microplate Heating System	**SpectraMax M5** Reader utilizes U.S. Patent No. 6,693,709 for the design of the plate heating mechanism. Molecular Devices is the sole source for microplate readers incorporating the plate heating technology as described in US Pat. No. 6,693,709.
Multimode Light Detection	**SpectraMax M5** Reader utilizes U.S. Patent No. 6,825,921 for its unique multimode light detection system. Molecular Devices is the sole source for microplate readers incorporating the multimode detection system as described in US Pat. No. 6,825,921.